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मानक

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Whereas the Parliament of India has set out to provide a practical regime of right to information for citizens to secure access to information under the control of public authorities, in order to promote transparency and accountability in the working of every public authority, and whereas the attached publication of the Bureau of Indian Standards is of particular interest to the public, particularly disadvantaged communities and those engaged in the pursuit of education and knowledge, the attached public safety standard is made available to promote the timely dissemination of this information in an accurate manner to the public.

“जानने का अधिकार, जीने का अधिकार”

Mazdoor Kisan Shakti Sangathan

“The Right to Information, The Right to Live”

“पुराने को छोड़ नये के तरफ”

Jawaharlal Nehru

“Step Out From the Old to the New”

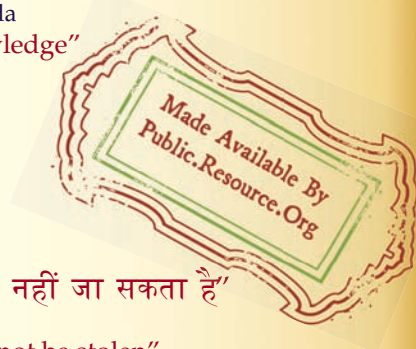
IS 13260 (1993): Method of grading for appearance of cotton yarn using photographic standards [TXD 1: Physical Methods of Tests]



“ज्ञान से एक नये भारत का निर्माण”

Satyanarayan Gangaram Pitroda

“Invent a New India Using Knowledge”



“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”

Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”

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भारतीय मानक

फोटोग्राफीय मानकों का उपयोग करते हुए सूती धागे के
रंग रूप के लिए ग्रेड निर्धारित करने की पद्धति

Indian Standard

**METHOD OF GRADING FOR APPEARANCE
OF COTTON YARN USING PHOTOGRAPHIC
STANDARDS**

UDC 677·072·33 : 677·011 : [620·168]

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FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards, after the draft finalized by the Physical Methods of Test Sectional Committee had been approved by the Textile Division Council.

The appearance of cotton yarn is one of the important qualities affecting its commercial value as it influences, to a great extent, the general appearance of fabric made out of it. The appearance grade of cotton yarn is evaluated by visual comparison of black-board wrappings of yarn with photographic standards, taking into account the various factors, such as the regularity, imperfections, freedom from foreign matter, neppiness and hairiness of the yarn.

This standard has been prepared with a view to eliminating unnecessary and undesirable variations in the procedure for evaluating the appearance grade of cotton yarn.

Taking into consideration the views of producers, consumers and testing authorities, the Sectional Committee responsible for the preparation of this standard felt that it should be related to the manufacturing and testing practices followed in the country in this field. Assistance has been derived from the following publications:

ASTM Designation : D 2255-87 Grading cotton yarns for appearance — American Society for Testing and Materials.

Pillay K. P. R., Shankaranarayanan K. S., Balasubramanian A. and Kandasami N. The Relationship of yarn appearance to certain factors of yarn quality. Proceedings of the Second Technological Conference held at SITRA, Coimbatore, 16 and 17 December, 1960.

Subramanian S., Mobedji J. D., (Mrs) Phalgumani G. R., Manjunatha B. R. Grading of yarn appearance — an objective approach. *Text Trade and Indus J*, Annual Number, V 18, No. 11-12, p 9, 1980.

Balsubramanian N, Gupte V. V. and Iyengar R. L. N. *Indian Cotton Gr Rev.*, 18, 66 (1964); also *CTRL Technol. Bull.* B-88 (1964).

Ukidve A. V., (Smt) Raje, C. R., and Oka, P. G. Relationship Between Appearance and Uster Evenness Parameter of Yarn. *J. Tex. Ass.*, 39, 3 (1978).

In reporting the result of a test made in accordance with this standard, if the final value, observed or calculated, is to be rounded off, it shall be done in accordance with IS 2 : 1960 'Rules for rounding off numerical values (revised)'.

Indian Standard

METHOD OF GRADING FOR APPEARANCE OF COTTON YARN USING PHOTOGRAPHIC STANDARDS

1 SCOPE

1.1 This standard prescribes a method of grading for appearance of single cotton yarn, carded or combed, with the use of BIS Photographic Cotton Yarn Appearance Standards.

2 REFERENCES

The following Indian Standards are necessary adjuncts to this standard:

<i>IS No.</i>	<i>Title</i>
3920 : 1985	Methods for sampling of cotton yarn for determinations of physical characteristics (<i>first revision</i>)
*SP 54	BIS cotton yarn appearance standards

3 TERMINOLOGY

For the purpose of this standard, the following definitions shall apply.

3.1 Package

A general term for a bobbin, cop, pirn, cone, cheese, bundle, etc, of yarn indicating that yarn is in a form convenient for transport for further processing.

3.2 Appearance Grade

The appearance of cotton yarn in the grey state evaluated by visual comparison of black-board wrappings of yarn with photographic standards and based on the assessment of regularity, freedom from imperfections, foreign matter, neppiness and lack of hairiness.

3.3 Fuzz

Untangled fibre ends that protude from the surface of yarn.

3.4 Neps

A tightly tangled knot like mass of unorganised fibres, that is, a small knot of entangled fibres. (In the case of cotton it usually comprises dead or immature cotton hairs.)

3.5 Thick Place

A yarn defect characterised by a diameter greater than that of the adjoining segments and extending for 6 mm. (The unevenness is normally caused by a greater number of fibres per yarn cross section than usual.)

3.6 Thin Place

A yarn defect characterised by a segment that is substantially (at least 25 percent) smaller in diameter than the average diameter of the yarn.

4 SAMPLING

4.1 To test conformity of a lot to a specification as regards appearance grade, samples shall be selected so as to be representative of the lot in accordance with the relevant material specification or in accordance with IS 3920 : 1985.

4.2 The number of packages to be taken at random from each selected bale (or case) shall be such that a total number of five packages are drawn from the lot. As far as possible, equal number of packages shall be drawn from each bale. However, there may be a need for drawing additional packages.

4.3 One board shall be prepared from each of these five packages.

5 EQUIPMENT

5.1 Yarn Board Winder

This is a manually operated or motor-driven machine used for winding yarn on the thermo-setting resin bonded laminate black board by rotating the clamped board end over end. The equipment is also fitted with a traversing guide to advance the yarn across the board as it is wound. The machine shall be capable of spacing the yarn evenly at the rate of 8, 10, 13, 15 and 19 wraps per cm (20, 26, 32, 38 and 48 wraps per inch) on the board with a tolerance of ± 10 percent.

NOTE — It should be ensured that the wraps per cm is within the limits of tolerance as the spacings of the yarn on the black board have an important bearing on the assessment made. This is due to the fact that more closely wounded yarn will have larger length for view on the board and consequently more imperfections per unit area. Obviously the effect will be opposite if the spacings are wider on the board.

*Under print.

Table 1 Requirements for the Preparation and Assessment of Yarn Boards

(Clause 5.4)

BIS Photographic Cotton Yarn Appearance Standards Series	Count Range		Count of Yarn Used for Board Preparation		Wraps per cm (per inch)
	tex	Ne	tex	Ne	
BIS 1	100 to 37+	6+ to 16 ^a	60	10	8 (20)
BIS 2	37 to 18.5+	16+ to 32 ^a	30	20	10 (26)
BIS 3	18.5 to 12+	32+ to 50 ^a	15	40	13 (32)
BIS 4	12 to 7.9+	50+ to 75 ^a	10	60	15 (38)
BIS 5	7.9 and below	75+ and above	6	100	19 (48)

NOTE — For assessing the appearance grade of yarn sample whose count value falls within the range of 6.0 Ne to 16.9 Ne (100 to 37 + tex), boards prepared at 8 wraps per cm (20 wraps per inch) should be assessed using BIS 1. For yarn samples having mean count values in the other ranges, boards are to be prepared and assessed using the respective standards boards as given in Table 1.

5.2 A cabinet provided with arrangement for proper illumination, for mounting the black-board wrappings and the BIS Photographic Cotton Yarn Appearance Standards (*SP 54) to evaluate the appearance grade of yarn.

5.3 The black-board laminate black-boards with dull finish on both sides on which yarn can be wound to cover an area of approximately 140 mm × 250 mm.

5.4 BIS Photographic Cotton Yarn Appearance Standards (*SP 54)

A set of BIS Photographic Cotton Yarn Appearance Standards consists of five series, covering five ranges of yarn counts (see Table 1). Each series has four photographs representing grades, A, B, C and D. Grade A is the highest and others are progressively lower. The range of counts covered by each series is given in Table 1.

6 DESCRIPTION OF YARN GRADES

6.1 Grade A Yarn

Grade A yarn may have no large neps which are over three times the normal diameter of the yarn and very few small ones. Grade A yarn should have good centimetre-to-centimetre uniformity and good cover without excessive fuzziness. No leaf nor other foreign matter may be present in Grade A yarn.

6.2 Grade B Yarn

Grade B yarn may have no large neps, but may have a few small ones. Grade B yarn may have no more than three small pieces of foreign matter per board or specimen provided they do not form slubs. Grade B yarn may be slightly more irregular and may have slightly more fuzz than a Grade A yarn.

6.3 Grade C Yarn

Grade C yarn may have more neps, and larger ones as well as more fuzziness and a greater amount of foreign matter than Grade B yarn. The contrast between the thick and thin places and the normal diameter of the yarn may be greater than in Grade B yarn resulting in an overall rougher appearance.

6.4 Grade D Yarn

Grade D yarn may have some slubs that are more than three times the average diameter of the yarn. Grade D yarn may have more neps, neps of a larger size, more thick and thin places, more fuzz and more foreign matter than Grade C yarn. When slubs or large neps are present, Grade D yarn may have fewer neps than Grade C yarn. Grade D yarn may have an overall rougher appearance than Grade C yarn.

6.5 Yarn Below Grade D

Yarn below Grade D may have more defects and an overall rougher appearance than Grade D yarn.

7 PROCEDURE

7.1 Set the winding device so as to obtain the required number of threads per cm on the black-board, depending upon the count range in which the yarn under test falls (see Table 1). Take one of the packages constituting the test sample and mount it on the winding device. Also mount the black-board on the device in such a way that yarn wound on it will lie along the length of the board covering an area of approximately 140 mm × 250 mm. In a similar manner prepare remaining black-board wrappings, taking for each black-board one package from the test sample.

*Till SP 54 is printed ASTM designation D 2255 : 87 'Grading Cotton Yarn for Appearance' may be used.

7.2 Mount one of the black-board wrappings in the cabinet and by comparison with series of the BIS Photographic Cotton Yarn Appearance Standards relevant to the count of yarn under test, mounted in the same cabinet, evaluate the appearance grade of yarn on the blackboard as A, B, C or D. Assess both sides of each black-board wrapping and assign the grade of the poorer side only as the grade of the specimen.

While assigning the grade of the black-boards it should be noted that slubs, thick places, neps and foreign matter are to be treated as worst defects. Yarns with slubs should not be assigned A or B grade.

7.2.1 It is preferable to get the assessment of the appearance grade of each black-board wrapping by a minimum of three observers.

7.2.2 *In case the black-board wrapping does not precisely conform to any of the above mentioned standard grades, namely, A, B, C, D but falls in between two consecutive grades, denote the appearance grade of the yarn by '+' mark after the letter designating the lower of the two grades.*

7.2.3 *In case the black-board wrapping appears poorer than Grade D, denote the appearance grade of the yarn as '<D' (Below D).*

7.3 Following the procedure given in 7.2, evaluate the appearance grade of the remaining black-board wrappings.

7.4 If the observers differ by more than one grade, five more packages may be drawn and evaluated.

8 CALCULATION

8.1 In acceptance testing, if no specimen falls more than one grade below that specified, determine the percentage of specimens that are equal to or better than the specified grade. If 80 percent of the specimens graded are equal to or better than the specified grade, and

remaining 20 percent do not fall below the next lower grade consider the lot as passing yarn appearance specification. If one or more specimens fall more than one grade below that specified, reject the lot.

8.2 For research and experimental purposes, convert the yarn appearance grade of all the five grades of each of the graders to their respective appearance index values using Table 2 and calculate the individual grader's average index. From the average index values of all the graders, calculate the average index value of the yarn sample, correct to an integer.

Table 2

Grade	Appearance Index
A and above	130
B+	120
B	110
C+	100
C	90
D+	80
D	70
Below D	60

9 REPORT

9.1 The test report shall include the following:

- Count of yarn as indicated on the package;
- Number of black-board wrappings examined;
- Average Appearance Index and Appearance Grade of the yarn in the lot;
- Range of grades; and
- Series number of the BIS Photographic Appearance Standards used for grading the sample.

Standard Mark

The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act, 1986* and the Rules and Regulations made thereunder. The Standard Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well defined system of inspection, testing and quality control which is devised and supervised by BIS and operated by the producer. Standard marked products are also continuously checked by BIS for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.